

AMENDMENTS TO THE CLAIMS

Claim 1 (original): An irradiation system comprising:

a radiation source arranged to emit a radiation beam along at least one beam path extending from the radiation source;

an inner shield disposed around the radiation source for attenuating radiation generated by the radiation source, the at least one beam path extending through at least one path aperture in the inner shield;

a first conveyor system for transporting articles through the beam path; and

an outer shield for attenuating radiation generated by the radiation source disposed around the inner shield and around at least a part of the first conveyor system.

Claim 2 (original): The irradiation system of claim 1, wherein the irradiation system is arranged into an upper level and a lower level, the first conveyor system and the radiation source being located on the upper level, the irradiation system comprising:

a second conveyor system located on the lower level.

Claim 3 (original): The irradiation system of claim 2, wherein the upper and lower level are separated by a support surface, the at least one beam path including a vertically extending beam path extending through a path aperture in the support surface for irradiating articles conveyed by the second conveyor system.

Claim 4 (original): The irradiation system of claim 1, wherein the first conveyor system comprises:

a process loop disposed around the inner shield.

Claim 5 (original): The irradiation system of claim 1, wherein the outer shield forms a first chamber and a second chamber, the first and second chambers being separated by a dividing wall and, the first chamber housing the radiation source.

Claim 6 (original): The irradiation system of claim 5, wherein the inner shield comprises:

a removable inner module for allowing access to the radiation source.

Claim 7 (original): The irradiation system of claim 6, wherein the outer shield comprises:

a removable outer module for allowing access to the radiation source, the removable inner module and the removable outer module being sized so that the radiation source can pass through the inner and outer shield when the removable inner and outer modules are removed.

Claim 8 (original): The irradiation system of claim 5, comprising:

a wall in the second chamber extending substantially parallel to the dividing wall.

Claim 9 (original): The irradiation system of claim 5, wherein the first conveyor system comprises:

a process loop disposed around the inner shield;

an entry conveyor system having a first end and a second end, the second end being arranged to convey articles to the process loop; and

an exit conveyor system having a first end and a second end, the first end being arranged to convey articles from the process loop, wherein the entry conveyor and the exit conveyor extend through an opening in the dividing wall.

Claims 10 (original): The irradiation system of claim 9, wherein the exit conveyor system and the entry conveyor system extend through an opening in the outer shield.

Claim 11 (original): The irradiation system of claim 5, the outer shield comprising:
two side walls;

a first end wall extending substantially perpendicularly to and connected to the side walls; and

a second end wall connected to the side walls, wherein the dividing wall is substantially parallel to the second end wall.

Claim 12 (original): The irradiation system of claim 11, comprising:
a wall in the second chamber extending substantially parallel to the dividing wall.

Claims 13 (original): The irradiation system of claim 1, wherein the inner shield comprises:

a removable inner module for allowing access to the radiation source; and
a removable outer module for allowing access to the radiation source, the removable inner module and the removable outer module being sized so that the radiation source can pass through openings left in the inner and outer shields when the removable inner and outer modules are removed.

Claim 14 (original): The irradiation system of claim 13, comprising:
at least one port in the removable outer module for allowing ballast material to pass out of the removable outer module.

Claim 15 (original): The irradiation system of claim 1, comprising:
a ceiling over the upper level comprising a volume of ballast material, a portion of the ballast material covering the outer shield.

Claim 16 (original): The irradiation system of claim 1, comprising:
a ceiling extending over the irradiation system and having at least one removable ceiling plug for allowing access to the radiation source.

Claims 17 (original): The irradiation system of claim 16, wherein the removable ceiling plug allows for removal of a subassembly of the radiation source from the irradiation system.

Claim 18 (currently amended): An irradiation system arranged in an upper level and a lower level, comprising:

a radiation source in the upper level arranged to emit a radiation beam along a first and second beam paths for irradiating articles on the upper level, and to emit radiation along a third beam path for irradiating articles on the lower level;

an upper level shield disposed around the radiation source for attenuating radiation generated by the radiation source, wherein the upper level shield is constructed of adjacent removable modules that are bolted together;

a first conveyor system for transporting articles through the first beam path; and

a second conveyor system for transporting articles through the third beam path.

Claim 19 (original): The irradiation system of claim 18, wherein the third beam path extends generally vertically from the upper level to the lower level.

Claim 20 (original): The irradiation system of claim 18, wherein the upper and lower level are separated by a support surface, the third beam path extending through a path aperture in the support surface.

Claim 21 (currently amended): The irradiation system of claim ~~19~~ 18, wherein the third beam path intersects the second conveyor system at a location below an area surrounded by the upper level shield.

Claim 22 (original): The irradiation system of claim 21, wherein the lower level includes a first chamber and a second chamber, the location where the third beam path and the second conveyor system intersect being located in the first chamber, and the first chamber being at least substantially covered by the upper level shield.

Claim 23 (original): The irradiation system of claim 18, wherein the radiation source is arranged to emit a radiation beam along a second beam path for irradiating articles on the upper level.

Claim 24 (original): . A method of removing a radiation source from an irradiation system comprising a radiation source arranged to emit a radiation beam along a beam path, an

inner shield disposed around the radiation source for attenuating radiation generated by the radiation source, and an outer shield disposed around the inner shield, the method comprising:

- disconnecting a removable module of the outer shield from the outer shield;
- disconnecting a removable module of the inner shield from the inner shield; and
- removing the radiation source from the irradiation system through openings left by the removable modules.

Claim 25 (original): The method of claim 24, wherein the step of disconnecting a removable module of the outer shield comprises:

- disconnecting an outer plate of the removable module of the outer shield from adjacent portions of the outer shield; and
- disconnecting an inner plate of the removable module of the inner shield from adjacent portions of the outer shield.

Claim 26 (original): The method of claim 25, wherein the step of disconnecting a removable module of the outer shield comprises:

- removing ballast material from the removable module of the outer shield.

Claim 27 (original): The method of claim 26, wherein the step of removing ballast material comprises:

- opening a port in a bottom portion of the removable module of the outer shield; and
- allowing the ballast material to pass through the port.

Claim 28 (original): . The method of claim 25, wherein the step of disconnecting a removable module of the outer shield comprises:

- unbolting the removable module of the outer shield from the adjacent portions.

Claim 29 (original): The method of claim 25, wherein the step of disconnecting a removable module of the inner shield comprises:

- removing ballast material from the removable module of the inner shield;

disconnecting an outer plate of the removable module of the inner shield from adjacent portions of the inner shield; and

disconnecting an inner plate of the removable module of the inner shield from the adjacent portions of the inner shield.

Claim 30 (new): A shield for a radiation system comprising:

adjacent hollow modules positioned in a path of radiation;
removable plates connecting the adjacent hollow modules;
ballast material filling the hollow modules.

Claim 31 (new): The shield of Claim 30 wherein the removable plates have two longitudinally extending rows of bolt holes to match corresponding holes on the hollow modules.

Claim 32 (new): The shield of Claim 31 wherein the modules comprise an inner plate; an outer plate; and a plurality of dividers located between the inner plate and outer plate.

Claim 33 (new): The shield of Claim 32 wherein the module is higher at the outer plate than at the inner plate.